

Harumi Ochi*: Contributions to the mosses of Bryaceae
from Japan and its adjacent regions (10)

越智春美*: 日本およびその近接地域における
カサゴケ科蘚類の研究 (10)

38) *Bryum capillare* and its allies. In (1845)³⁾ F. Dozy and J. H. Molkenboer reported *Bryum torquescens* from Japan; this is the first record on the member of the group being brought under discussion in this paper. Afterwards, the following species and varieties were recorded from Japan and the adjacent regions, respectively:

B. capillare Hedw. reported by W. Mitten (1864) from Nagasaki (Kyūshū) and Ningpo (China), by Y. Horikawa (1939) and by U. Mizushima (1957)⁴⁾ from Asakawa, Tokyo Pref.;

B. nagasakense Brotherus (1899) described from Nagasaki, and reported by Brotherus and G. Paris (1902) from Matsu and Mt. Tsurugisan (Shikoku);

B. (?) taitumense Cardot (1905) described from Taitum (Formosa);

B. nagasakense var. *laxifolium* Cardot (1909)²⁾ described from Mt. Ishizuchi (Shikoku);

B. tosanum Cardot (1909) described from Tosa (Shikoku);

B. capillare var. *rubrolimbatum* Brotherus (1910) described as species from Philippine;

B. torquescens Broth. reported by Y. Horikawa (1950) from Tottori (south-western Honshū);

B. capillare var. *flaccidum* Broth. et Schimp. reported by K. Sakurai (1953)⁵⁾ from Ozegahara (central Honshū) and

B. higoense Ochi (1956) described from Higo (Kyūshū) and Tosa.

In this paper, I am going to discuss on these 6 species, 3 varieties and a few related taxa.

B. capillare is one of the most widely distributed and very variable species, and it is very difficult to understand the concept of this species unless the world-wide revision of this group is carried out. Through courtesies of Mr. E. B. Bartram, Bushkill, Pike Co., Pa., U.S.A., Drs. H. Persson of Naturhistoriska Riksmuseum, Stockholm, H. A. Crum of National Museum of Canada, H. Roivainen of Botanical

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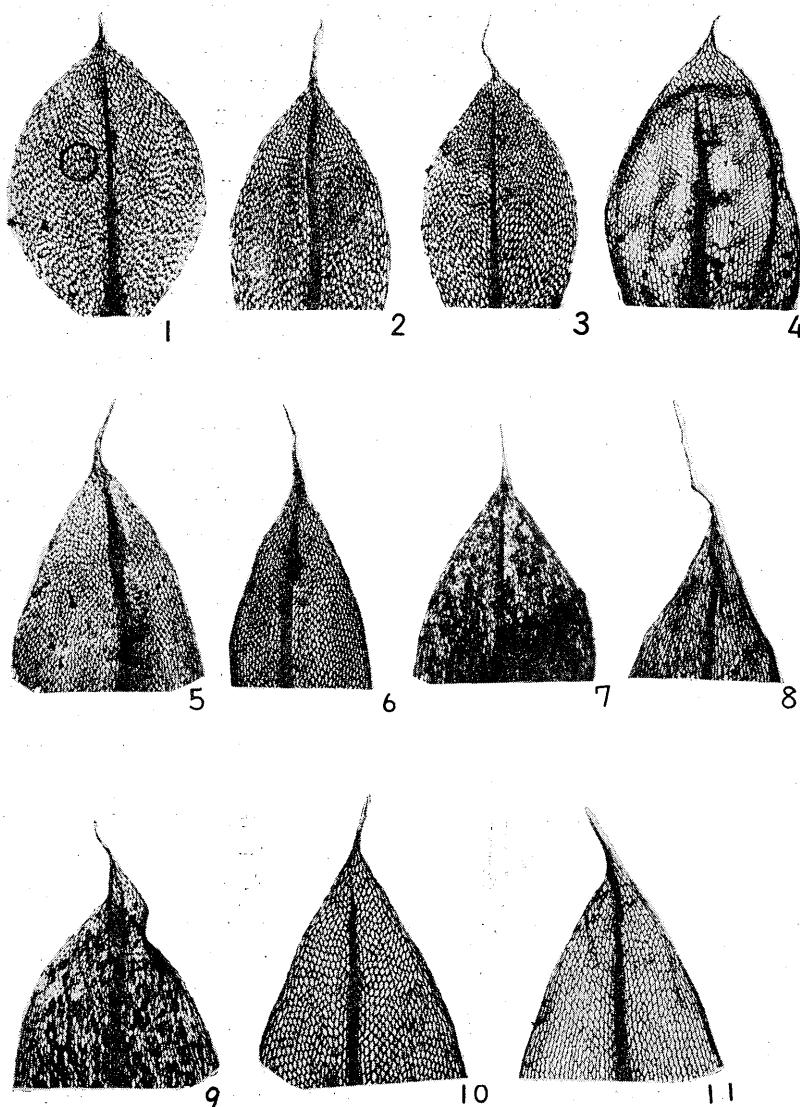


Fig. 1. Leaves of *B. capillare*: 1-3. Mt. Asahi, Yamagata Pref., ca. 1650 m, on rotten log (type 1), 4, Kamikochi, Nagano Pref., ca. 2100 m, on soil (transitional form), 5-6. Mt. Ishizuchi, Ehime Pref., ca. 1800 m, on rock (transitional form), 7-8. Mt. Akaishi, Pref. Nagano, ca. 3000 m, on soil (type 2), 9-11. Sweden; all \times ca. 100.

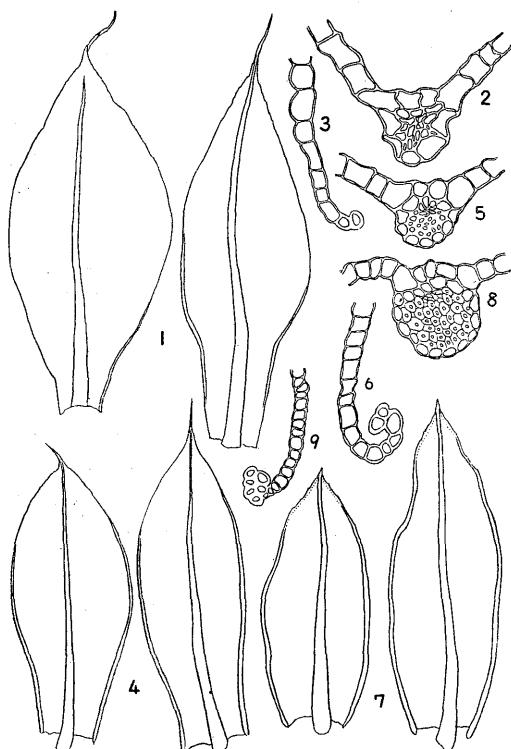
Museum, Helsinki University and D. P. Rogers of the New York Botanical Garden, I was able to examine some specimens cited in their papers and many material and specimens for comparison. I wish to express my great gratitude for their kindness. I was able to give the present paper by the following gentlemen who

have helped me in making available the specimens and material for this study. I am very much indebted by them for their kindness: Professors Y. Horikawa and A. Noguchi, Drs. M. Tagawa, S. Hattori and N. Takaki, Mrs. U. Mizushima, Messers H. Suzuki, M. Saito, H. Ando, K. Mayebara, Z. Iwatsuki, Y. Ikegami, K. Oti, T. Nakajima, T. Higuchi, R. Watanabe, I. Nagano, S. Nakanishi, T. Osada, Ch. Igi and others.

In 1954, I gave⁷⁾ a detailed description and illustration on *B. tosanum* and compared it with *B. capillare* and *B. nagasakense*. As described there, *B. tosanum* seems to be merely a modification of *B. nagasakense*. Where should, however, *B. nagasakense* stand in relation to *B. capillare*?

Fig. 2. Leaves ($\times 13$), cross-sections of the costal part of leaves ($\times 125$) and ditto of leaf-margins ($\times 125$) of *B. capillare* (from Mt. Akaishi, alt. ca. 3000 m, The Jap. South Alps, Central Honshu; 1-3), *B. capillare* var. *rubrotubatum* (from the foot of Mt. Chokai, ca. 300 m, Yamagata Pref.; 4-6) and *B. donianum* (from Dubrovnik; 7-9).

Before entering into the discussion of the relationship between *B. capillare* and *B. nagasakense*, *B. capillare* occurring in Japan must be properly understood. *Bryum capillare* is one of the Hedwigian species and the nomenclatural type is the description in Hedwig's Species Muscorum (1801). The important characteris-



tics of the gametophytes of the typical *capillare* are recognized as follows: leaves broadly oblong or broad-spatulate, acuminate, with capillary points, narrow-bordered, margins long-reflexed, entire or sometimes indistinctly serrulate in upper part, costa diminishing below apices, but sometimes excurrent entering into the capillary point, when dry leaves not deciduous, twisted, free or contorted around the stem. In Japan, there occur the following two types. **Type 1** of *B. capillare* distributes in cold places descending to the deciduous broad-leaved tree region: Plants sterile, leaves ovate, short acuminate, promptly narrowed towards the base; when dry twisted but not to the degree to coil around the stem and tending to be deciduous; when moist almost plane in leaf-margins, although sometimes revolute at most half way up to the whole length in the basal parts, serration distinct towards apices, border narrow and not thickened, costa not strong, usually diminishing below the apices, but sometimes excurrent entering into capillary tips especially in the upper leaves (fig. 1). The sterility is high in the plants from lower or warmer places such as *Fagus* zone and there the plants occur always on soil in shade and not on rocks, bark of trees, roofs etc. **Type 2** distributes in places colder or higher in altitude, compared with type 1, in coniferous to alpine zones of central Honshū. This one differs from the type 1 in the followings: plants sometimes fertile, more robust, leaves larger, the capillary tips of the leaves more prominent, serration more indistinct (figs. 1 and 2). It is of interest that the type 2 occurs on the rocks, bark of trees rotten logs, etc., and not on the soil. So far as I have concerned, the type 1 of *B. capillare* does not occur in northern Europe (through the courtesy of Dr. Persson and others I have examined more than 100 packets of specimens collected in Europe, but I have found none belonging to this type), and is presumably distributed in the cold-temperate zone of Japan and North America (I have recognized only one packet of this type collected in Africa, kept in herb. Bartram). On the other hand, the type 2 is very similar to the typical *capillare* occurring both in northern Europe and North America. Up to the present time I have examined 107 packets (of these only two are fertile) belonging to this species collected in Japan and Corea and recognized various transitional forms between the type 1 and 2. Accordingly, in spite of the fact that the type 1 seems fairly different from the typical *capillare* in habits when dry, leaf-shape and margins of leaves, two types occurring in Japan can not be separated as distinct taxa.

B. nagasakense (fig. 2) occurs on the rocks, roofs and bark of trees and not on the soil though it occurs sometimes on the soil in contact with rocks on which

the main part of the cushion of the moss often grows. In the colder places, this occurs always on rocks, especially on basic substratum such as limestone or concrete. At the northernmost station of this species, known at present i. e. the foot of Mt. Chōkai, Yamagata Pref., at alt. ca. 300m, it occurs on volcanic rocks, but on which thin layers of cement are scattered here and there; and it is a very interesting fact that I have found none of this species growing on naked volcanic rocks in the neighbourhood. At one of the highest stations of this species, i. e. at alt. ca. 1100m on Mt. Daisen, Tottori Pref., it occurs on the concrete base of a cottage. In the Todai limestone area, Nagano Pref. (I have never visited there), it occurs on limestone, at alt. ca. 1400m. In such a high or northern habitat, where *B. capillare* (type 1) often occurs on the soil in shady places (fig. 3), I have never found transitional forms between *B. capillare* and *B. nagasakense*. Judging from these facts, I once inclined to separate specifically *B. nagasakense* from *B. capillare*. However, if we examine the specimens collected in Europe and North America, it is not difficult to find the form similar to *B. nagasakense*. In the specimens collected from western coast of North America (through the courtesy of Dr. Crum and others, I have examined more than 120 packets, of which 57 are from Vancouver Island), I have found five packets which are very close to the type 1 of Japanese *B. capillare*, two packets being similar to *B. nagasakense* and various transitional forms between *B. capillare* and *B. nagasakense*, although I have never found such transitional forms in Japan and Europe. It is unfortunate to state here that the data of the habitats are not described in detail on each packets of the North American specimens and that I cannot discuss on the sporophytes of Japanese *B. capillare* because they are usually sterile. But, considering these facts above mentioned, *B. nagasakense* can be seen to be included in the species category of *B. capillare*.

Judging from the habitat preference and the differences in the morphology especially when dry, recognized from many packets of specimens (I have examined about 440 packets of *B. nagasakense*) I have come finally to the conclusion that *S. nagasakense* is a stably fixed ecotype and that it is merely a variety under *B. capillare*. As mentioned above, however, it should be noted that the form similar to the Japanese *nagasakense* also occurs in Europe and North America. I am not certain that any names have been given to such forms in these areas or not.

B. capillare cited by Mitten based on the specimens collected from Nagasaki and Ningpo is not presumed to be var. *capillare*, but *nagasakense*. The one

illustrated by Horikawa (1939) under the same name seems to be also *nagasakiense*. Also *B. (?) taitumense* seems to be a form of *B. nagasakiense*. As the non branching character of the stems is sometimes recognized in *B. nagasakiense* from southern Japan and it is not difficult to find the transitional forms between the two, it must be reduced also to *nagasakiense*. As I have never seen the type of *B. nagasakiense* var. *laxifolium*, I can comment nothing on it now.

Finally, on examining the type specimen of *B. capillare* var. *rubrolimbatum*, I am convinced that this stands very near by *B. nagasakiense*. We can find similar plants in Japan and, in addition, we can recognize the transitional forms between this and *B. nagasakiense*. Therefore this one should be the same variety under *B. capillare*. Hence, under art. 66 of the International Code, var. *rubrolimbatum* must be adopted as a correct name for *B. nagasakiense* under *B. capillare*.

B. donianum is a species standing closely to *B. capillare*. The thickened border of the leaves is an important character of *B. donianum*, but the grade in thickness is fairly variable and this thickness in *B. rubrolimbatum* seems to be intermediate between *B. capillare* and *B. donianum* (fig. 2) and, in addition, some transitional forms have been recognized between *B. rubrolimbatum* and *B. donianum*. In accord with these facts, it may be better to treat *B. donianum* as conspecific with *B. capillare*. But, unfortunately, I have examined but few specimens of *B. donianum* collected in Europe and Japan, I hesitate to give a definite opinion on this problem. I will provisionally treat *B. donianum* as an independent species in this paper.

B. torquescens is a synoicous form of this group. In Japan, I have discovered only one packet of material very similar to *B. rubrolimbatum* except for the sexual differentiation. The specimen cited by Horikawa (1950) is dioicous, and it is not *B. torquescens*, but seems to be *B. rubrolimbatum*. The specimens often determined to be *B. torquescens* are variable in forms, except for being synoicous and having more developed costa than var. *capillare*. As the unstableness of the sexual differentiation are often found in the other groups of mosses and the degree of costal development is a character not so important as to separate taxa specifically, I presume that forms determined as *B. torquescens* are derived from various forms of *B. capillare* such as var. *capillare*, *rubrolimbatum* and allied forms in Europe, North America and the other continents. For these reasons, the synoicous plants are presumably included in several taxa in respective areas, although I have not yet examined the specimen of *B. torquescens* cited by Dozy and Molkenboer (1845).³⁾

As reduced by some authors to a synonymy of *B. capillare*, *B. elegans* stands also near to *B. capillare* and we can find similar plants also in Japan. So far as the results obtained from the observations of scanty Japanese material, however, it is difficult to distinguish these plants from *B. capillare* specifically. But as I have examined only a few material collected in Europe for comparison, I hesitate to discuss on the relationship of this one to *B. capillare* and provisionally I will include the Japanese material similar to *B. elegans* under *B. capillare* here.

I have not examined the specimen of *B. capillare* var. *flaccidum* cited by Sakurai (1953).⁹⁾ I have examined some specimens belonging to this variety collected in Europe and North America for comparison. In Japan, some of the type 1 of *B. capillare* are close to this variety and those occurring in very shady places represent the characters of this variety. Therefore I am going to refer them to this variety. And, in addition, I have recognized another type of plants to be referred to this variety: it occurs in shady lowland of southern Japan; and this type seems to have originated from var. *rubrolimbatum*, contrary to the former which seems to have originated from type 1 of *capillare*.

Would the following supposition be admitted for the explanation of the differentiation and distribution of *B. capillare* and its allies? *B. capillare* is presumed to be one of the "mixohydric" mosses and water economy plays perhaps the greatest role on it in relation to these problems. Possible origin of *B. capillare* has perhaps arisen in a district representing a fairly cold climate such as seen in the present subarctic zone, because this species is abundantly fruiting in the subarctic countries of Europe, Asia and North America or the high stations under similar climatic conditions. On the contrary, in warmer and lower places, it tends to be sterile. Judging from the works made by A. Noguchi and his co-workers (1956,⁵⁾ (1957),⁶⁾ deciduous character of the leaves recognized in the type 1 of *B. capillare* is supposed to be a representation of asexual reproduction. This type perhaps differentiated to adapt to too warm zone where no sexual reproduction is able to take place. And then, one of the most important characters of the type 1 having weak costae of the leaves is perhaps the representation that the plants keep their lives only in shady places. If the plants of this type were emigrated to sunny places in warm and dry climate, they would dry up in a short while because the weak costa cannot make pace with the rapid water loss by active transpiration. But, in higher or colder places as mentioned above, it can grow even on rocks in open places because the relative atmospheric humidity is supposed to be usually high

and, in addition, active transpiration hardly takes place there. The weak costa and long capillary tips of the leaves are perhaps the results of adaptation by which the plants are capable of absorbing atmospheric moisture (Ochi, 1957⁹); and this tells us the possibility of transition from "mixohydric" to "ectohydric." *B. ele-*

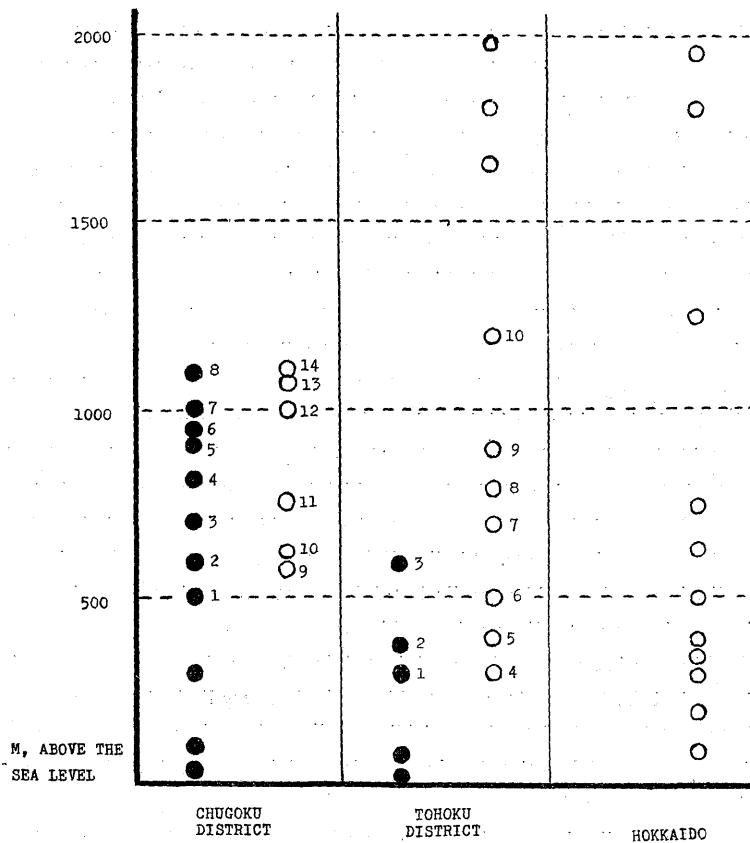


Fig. 3. Vertical distribution of *B. capillare* (circle) and *B. capillare* var. *rubrolimbatum* (solid circle): Chugoku district—1. Wakasa-machi, Tottori Pref., on roof, 2. Sandankyo, Hiroshima Pref., on rock, 3-6. Mt. Daisen, Tottori Pref., on rocks, 7. Mt. Hyonosen, Tottori Pref., on bark of tree, 8. Mt. Daisen, on concrete wall, 9. Wakasa-machi, on soil, 10. Sandankyo, on soil, 11. Wakasa-machi, on soil, 12. Mt. Daisen and Mt. Hyonosen, on soil, 13. Wakasa-machi, on soil, 14. Mt. Daisen, on soil. Tohoku district—1. Mt. Chokai, Yamagata Pref., on rock, 2. Okutadami, Fukushima Pref., on rock, 3. Mt. Otakine, Fukushima Pref., on limestone, 4. Ins. Kinkazan, Miyagi Pref., on soil, 5-6. Okutadami, on soil, 7-8. Mt. Chokai, on soil, 9-10. Ozegahara, Fukushima Pref., on soil.

gans seems to be more ectohydric than this type: densely tufted stems, closely arranged and very concave leaves should perhaps be referred to so-called "inter-organic capillary system" (interorganes Kapillarsystem, H. Buch, 1947),¹⁾ and may be adaptive characters to more open and colder or higher habitats than those of *B. capillare*.

B. rubrolimbatum seems to be a race which has adapted to dry habitats in the warm-temperate zone and it is presumed to be closer to "endohydric" than var. *capillare*. Well developed costae and thick borders are perhaps an adaptation to such environments. *B. rubrolimbatum* is abundantly fruiting in the warm-temperate zone in Japan, contrary to *B. capillare* bearing fruit abundantly in the subarctic zone; and this fact seems to be of great interest. For the explanation of this fact, I propose a supposition as follows: In the glacial period, even the lowland of southern Japan was inhabited by typical *capillare* on various substrata. When it became gradually warmer, some of them differentiated to the forms resistant in warmer and dryer environments and finally fixed to the present *rubrolimbatum*. But var. *capillare* could not adapt to the warmer and dryer lowlands and remained only in colder or higher places in Japan as seen now.

Considering these, the type 2 of *capillare* in Japan is one of the residual elements and the type 1 is a derived form which has adapted to comparatively warm climate. *B. rubrolimbatum* also seems to be a residual elements differentiated in dry and warm environments. Similar differentiation has perhaps taken place in the other districts of the world as well; but I have not been able to examine so many foreign specimens as to discuss the problem.

B. higoense has perhaps been originated in *B. rubrolimbatum* and not directly in the typical *capillare*. At present, this species has very limited range and peculiar habitat: that is on obsolete charcoal kiln or allied places in southern Japan. This species may have differentiated only recently, and is presumed to be more endohydric than *B. rubrolimbatum*.

Would the following conclusion be an adventure? *B. capillare* has differentiated rather southward than northward because *B. capillare* has arisen in a district of fairly cold climate and the glacier seems to have played a great role in the differentiation.

Bryum capillare Hedw. Spec. Musc. : 182 (1801).

Japan—Hokkaidō: Provs. Kitami (including Is. Rebun and Is. Rishiri), Ishikari, Tokachi.

Honshū: Prefs. Akita, Yamagata, Miyagi, Fukushima, Gumma, Niigata, Nagano, Yamanashi, Shizuoka, Aichi, Ishikawa, Mie, Wakayama, Hyōgo, Tottori, Shimane and Hiroshima.

Shikoku: Prefs. Ehime and Tokushima.

Corea: Kang-Ouen-To, Tjang Tjyen, Mt. Diamond and Is. Quelpaert.

var. **flaccidum** Br. et Schimp. Bry. eur. IV fasc. 6/9: 61 (1939).

Japan—Honshū: Prefs. Aomori, Saitama, Niigata (Is. Sado), Nagano, Shizuoka, Shiga, Kyōto and Hyōgo (Is. Awaji).

Kyūshū: Pref. Kumamoto.

var. **rubrolimbatum** (Broth.) Bartr. Philip. Journ. Sci. 68: 142 (1939).

Bryum nagasakense Broth. Hedw. 38: 219 (1899); Broth. et Paris. Bull. Herb. Boiss. 2 sér. Tom. 3: 923 (1902); Amakawa and Osada, Journ. Hattori Bot. Lab. 17: 48 (1956).

Bryum (?) *tatumense* Card. Beih. Bot. Centralb. 19: 110 (1905).

Bryum tosanum Card. Bull. Soc. Bot. Genéve 2 sér. 1-3: 128 (1909).

Bryum rubrolimbatum Broth. Philipp. Journ. Sci. 5: 146 (1910).

“*Bryum capillare* Hedw.” Mitten. Journ. Linn. Soc. Bot. 8: 152 (1864).

“*Bryum capillare* L.” Horikawa, in Asahina’s Nippon Inka Shokubutsu Zukan: 907 (1939).

“*Bryum torquescens* Bry. eur.” Horikawa, Hikobia 1: 27 (1950).

Japan—Honshū: Prefs. Iwate, Yamagata, Miyagi, Fukushima, Tochigi, Gumma, Saitama, Tōkyō, Kanagawa, Niigata (incl. Is. Sado), Nagano, Yamanashi, Shizuoka, Ishikawa, Fukui, Mie, Kyōto, Nara, Osaka, Wakayama (Nakanishiki, June, 1905, no. 23, det. by Brotherus as *B. nagasakense*, in H*), Hyōgo, Tottori (Faurie, May, 1899, no. 697, det. by Brotherus as *B. nagasakense*, in H*), Shimane, Okayama, Hiroshima and Yamaguchi.

Shikoku: Prefs. Kagawa, Tokushima, Ehime (Nomura, May, 1954—H. O. 4206, synoicous form) and Kōchi (Okamura, July, 13, 1904, no. 88—isotype of *B. tosanum*, in NICH*).

Kyūshū: Prefs. Fukuoka (incl. Is. Tsushima), Oita, Nagasaki (Oldham, on moist rocks, in CAN*), Kumamoto, Miyazaki and Kagoshima.

Corea: Is. Quelpaert. New to Corea.

* Herbarium abbreviations adopted in Lanjouw & Stafleu’s Index Herbariorum Part 1 (3rd Ed.): 169-185 (1956).

Formosa : (Tatum (Faurie, May 7, 1903, no. 39—isotype of *B. (?) taitumense*, in KYO*) and Taihoku.

China : Ningpo, on city wall (Oldham, June, 1861, in NY*).

Philippines : Luzon, Benequet Prov., Pauai, ca. 2100m (R. C. McGregor, June, 1909, no. 8702—fragment of holotype of *B. rubrolabiatum*, in herb. Bartram).

Bryum donianum Greb. Jonian. Crypt. Transact. Linn. Soc. **15** : 345 (1828).

Honshū : Pref. Hiroshima, Ryōke-mura, Kōnu-gun, ca. 350m, on soil (Suzuki, Feb., 1949, no. 4808—H. O. 1811).

Shikoku : Pref. Kōchi, Tsudai-mura, Hata-gun, on soil of cliff (Ando, May, 1953, no. 13064—H. O. 4100). New to Japan.

Bryum higoense Ochi, Journ. Jap. Bot. **31** : 362 (1956).

Honshū : Pref. Osaka, Chihayaguchi, Minami-kawachi-gun, ca. 300m, on bank of soil (Mizutani, Apr. 20, 1952, no. 2052—H. O. 6746). New to Honshū.

Shikoku : Pref. Kōchi.

Kyūshū : Pref. Kumamoto.

Literature cited (except for those fully cited in the text)

- 1) Buch, H. : Soc. Sci. Fenn. Comm. Biol. **9**, No. 20 (1947). 2) Cardot, J. : Bull. Soc. Bot. Genève 2 sér. **1-3** : 128 (1909). 3) Dozy, F. and J. H. Molkenboer : Musci frondosi inediti Archipelagi indici, sive Descriptio et adumbratio Muscorum in insulis Java Borneo, Sumatra, Celebes, Amboina nec non in Japonia II : 1-24 (1845). 4) Mizushima, U. : Bull. Governm. Forest St. No. **95** : 190 (1957). 5) Noguchi, A. and H. Furuta : Journ. Hattori Bot. Lab. **17** : 32-44 (1956). 6) _____ and I. Miyata : Kumamoto Journ. Sci. Ser. B, Sect. 2, **3-1** : 1-19 (1957). 7) Ochi, H. : Journ. Jap. Bot. **29** : 267 (1954). 8) _____ : Bryologist **60** : 11 (1957). 9) Sakurai, K. : Bot. Mag. Tokyo **66** : 161 (1953).

38) ハリガネゴケとその近縁種

ハリガネゴケは最も広く分布する蘚類の一種で、変異にも富んでいためか分類学上混乱を起しやすく、現在までに世界各地で多くの異名が与えられてきた。ハリガネゴケ属の如き大属の中にはこのような混乱を招きやすい種を含む群がいくつかあつて困らせるのであるが、今回はそのような群の一つとしてハリガネゴケ群をとりあげた次第である。

先ず日本産ハリガネゴケの実態の把握が必要であるが、我が国には欧米の北部にみられるような典型的なハリガネゴケはみられない。本州中部の高山の高所などにみられる

ものは欧米北部のものにかなり近いものであるが、次第に低所又は暖地の大まかに言えばブナ帯にまで同系統とみられるものが下降している。高所では岩上、朽木上、樹皮上、土上などその基物の種類や育地の目当たりに変化があるが低所では必ずやや陰所の土上に生じ、乾くと同時に葉がポロポロ落ち、——恐らく無性繁殖の一方法と思われる——不穏性を示すものである。

次に我が国で大まかには常緑闊葉樹帯を本拠としてナガサキハリガネゴケがみられる。このものはよく子囊をつけるが、前者がブナ帯まで下降すると必ず土上に生じるに反し、陽地の岩上、屋根上などに好んで生育している。時にはブナ帯にも生じることがあるが、その上限や北限附近では石灰岩やセメントなどの塩基性岩上に生じる。このような地点では附近の陰地の土上には上記のハリガネゴケが生じているが、それら二者の中間型ないし移行型はみられない。このような我が国における観察結果だけから考えると両者は区別してもよいように思われる。Mitten が長崎と支那の寧波からハリガネゴケとして報告したもの、堀川教授が日本隱花植物図鑑に書かれたハリガネゴケ、高知県産の標本に基いて立てられたトサハリガネゴケ、台灣台中産の不稔品に基いて立てられたタイツムハリガネゴケ、フィリッピン産の *B. capillare* var. *rubrolimbatum* などは皆ナガサキハリガネゴケにあてるべきものと思われる。ネジレハリガネゴケも僅か一点だけで出てきたが、その性分化以外はナガサキハリガネゴケと区別できないので、ここではやはり同一種に含めて考えたい。

ところで注意を要することは歐洲や北米にもナガサキハリガネゴケにごく近いもののがみられることである。又日本や北欧には未だハリガネゴケとナガサキハリガネゴケとの中間型はみられないが、北米西海岸には我が国のブナ帯にみられる型のハリガネゴケ、ナガサキハリガネゴケに近いもの、ハリガネゴケとナガサキハリガネゴケの中間型などがみられる。このようなことから考えて、結局ハリガネゴケとは同一種とみるべきものであろうと思うようになつた。

しかしながら両者は育地からみても形態的にも上述の様な差があるのでナガサキハリガネゴケが暖地の岩上や屋根上樹皮上などに適応するように分化して固定したものという意味で変種としての階差を設けて区別することにしたい。この場合 *B. capillare* の変種としては var. *rubrolimbatum* が最も早い変種名であるのでナガサキハリガネゴケの学名としてはこれを採用することとなる。ナガサキハリガネゴケの分化は次のように説明すると好都合なのではあるまいか。すなわち“氷河時代には日本の現在の常緑闊葉樹帯にあたるところも北方から入つて來たハリガネゴケの基本種が分布していた。しかしそこがだんだん暖くなつてきたときその陽地の岩上などに適するものが分化してきて、それが結局ナガサキハリガネゴケになつた。一方あまり分化できなかつたハリガネゴケの基本種は暖地に適応できずに絶えてしまつて寒地や高所にのみ残つた。そのうちやや暖地におそらく無性繁殖をして残り得るように分化したものが現在のブナ帯にみら

れる型のものではなかろうか”と。

桜井博士の発表されたコモチハリガネゴケはみていないが *var. flaccidum* にあたるものは我が国にもみられる。ハリガネゴケの基本種から変つたとみられるべきものとナガサキハリガネゴケから変つてきたとみられるものがある。

南欧にみられる *B. donianum* にあたるものが我が国にもみられる。葉縁が厚く分化しているのが特徴であるからツベリマゴケの新称を付したい。これも暖地の乾燥地にみられる型と思われナガサキハリガネゴケとの間に中間型があるようである。しかし比較標本として欧洲産のものを僅か4点しかみていないし、ここで断定的なことをのべるのをさせて一応独立種として扱つておきたい。

ハリガネゴケよりも更に北方ないし高所に適応した型と思われるものが *B. elegans* である。我が国の高山にもそれに近いと見るべきものが若干出現している。しかし *B. elegans* の特徴である密に集つて束をなす植物体、著しく concave な葉などは程度の問題で、少くとも上記日本産のものはハリガネゴケから特に区別すべきものとも思えないで、前者に含めて取扱うことにしたい。

ヒゴハリガネゴケはナガサキハリガネゴケから分化したとみるべきものであろう。その特異な育地や分布域から考えるとごく新しい種と言えるのではなかろうか。やはり暖地の乾燥した育地に適した型と言うべきであろう。

結局我が国産のハリガネゴケ群はハリガネゴケ、ツベリマゴケ、ヒゴハリガネゴケの3種とコモチハリガネゴケおよびナガサキハリガネゴケの2変種とに整理するのが適当であろう。

□ 柴田桂太編：資源植物事典（増補改訂版）Keita Shibata: A cyclopedia of useful plants and plant products (Enlarged and revised edition)

本書の第一版が出てから既に8年の歳月が流れようとしている。当時資源科学研究所の植物関係の人達が大きな野望を持つてまとめ上げた作品も、其頃の製本材料の不充分さと挿図にあまり凝りすぎて懷古趣味のきらいがあつたことは否めなかつた。また地球上の天然資源は其頃も今もあまり変りはないが、これを利用する途はこの数年間に多方面に開拓された。これらの問題を考慮に入れて新装成つたのが今回の改訂版である。植物名索引のほかに新たに事項名索引120頁分も追加された。一番目立つのは多數のアート刷図版である。我国の重要な或は特殊な天然資源でありながら、あまり類のものない写真図版を多数揃えている。科学的であることは云ふまでもないが詩味が溢れているのが嬉しい。印刷は半七で悪からう筈もない。図版の説明だけでも横文字がほしいと思つた。発行所 北隆館 昭和32年5月25日発行 定価2,500円（小林）。